

TAXONOMIC POSITION OF THE INDIAN SPECIES OF GRASS FEEDING
DELTOCEPHALINE LEAFHOPPERS ASSIGNED TO
THE GENUS *ALLOPHLEPS* (HEMIPTERA : CICADELLIDAE)¹

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(With five text-figures)

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The genus *Allophleps* is redefined based on the specimen from Africa. The Indian species assigned to this genus are transferred to the genus *Deltocephalus* which is redefined along with a key to the Indian species. The following new combinations are proposed: *Deltocephalus indicus* (Pruthi) and *D. menoni* (Rao and Ramakrishnan). *Allophleps delhiensis* Rao and Ramakrishnan is treated as a major synonym of *D. indicus*.

INTRODUCTION

Bergroth (1920) described the genus *Allophleps* for his new species *Allophleps inspersa* from Kenya. Pruthi (1936) described *Allophleps indicus* from Lyallpur (Pakistan), thus recording the genus from the Indian subcontinent. Rao and Ramakrishnan (1990) provided the diagnosis of the genus based on the Indian species and added two new species, namely *A. delhiensis* and *A. menoni* from New Delhi. They also provided a key to the three known species from the Indian subcontinent.

During our studies of the Indian *Deltocephalus*, we discovered a number of specimens assignable to the three known species of *Allophleps*, but we realised that the species from the Subcontinent were misplaced in *Allophleps*. An examination of the authentically identified specimen of *A. inspersa* confirmed our doubt and we report here the results of our studies.

The abbreviations used for the depositories are as follows: BMNH – The Natural History Museum, London; NPC - National Pusa Collection, Indian Agricultural Research Institute, New

Delhi; UAS - Department of Entomology, University of Agricultural Sciences, Bangalore and ZSI - Zoological Survey of India, Calcutta.

Allophleps Bergroth

Allophleps Bergroth 1920: 27. Type species: *Allophleps inspersa* Bergroth, by original designation.

Macropterous leafhoppers measuring more than 6 mm. Head slightly narrower than pronotum, longer medially than next to eyes. Vertex polished. Face slightly wider than long, shagreened, antennal ledge well developed, impinging slightly on clypeus, ocelli close to eyes. Pronotum with carinate lateral margins, transversely wrinkled, sparsely punctate, polished. Scutellum polished, area beyond impressed line transversely rugulose. Fore wing without accessory cells, outer ante-apical cell smallest, apically narrowed. Hind femoral spinulation 2+2+1.

Male pygophore with well developed anterior apodeme, a group of macrosetae on dorsal margin at the base of origin of anal segments; lobe narrowed with sclerotized bar along dorsal area, apex sclerotized, pigmented. Valve broad with a median angular projection on caudal margin. Subgenital plate triangular with outer marginal row of stout setae. Style with small preapical lobe, apophysis well developed, apex broadened with prominent crenulations.

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Connective Y-shaped, arms well separated, stem distally bilobed. Aedeagus articulated with connective, shaft curved tubular, apex flared with large gonopore, ventral part produced into a bilobed process beyond gonopore, dorsal apodeme well developed.

Remarks: Oman *et al.* (1990) placed this genus under the tribe Fieberiellini. However, because of the well developed apophysis of style and Y-shaped connective with divergent arms, we place this genus in the tribe Euscelini.

Allophleps inspersa Bergroth, 1920
(Figs 1-5)

Allophleps inspersa Bergroth, 1920: 28.

Material examined: Tanganyika: 1 ♂, Lake Nyassa, 1,600 ft (488 m), 34° 00' E, 9° 30' S, 28.viii.1959, Cambridge E. Africa Exped. B.M. 1960-50, *Allophleps inspersa* Bergr. Det. M.D. Webb, comp. with type (BMNH).

Indian species of *Allophleps*

The male genitalia and wing venation of the three species from the Indian subcontinent assigned to *Allophleps* are well illustrated by Pruthi (1936) and Rao and Ramakrishnan (1990), hence they are not illustrated here. A study of these species suggests that they belong to the genus *Deltocephalus* of the tribe Deltocephalini. The genus *Deltocephalus* is redefined here (Kramer 1971).

***Deltocephalus* Burmeister**

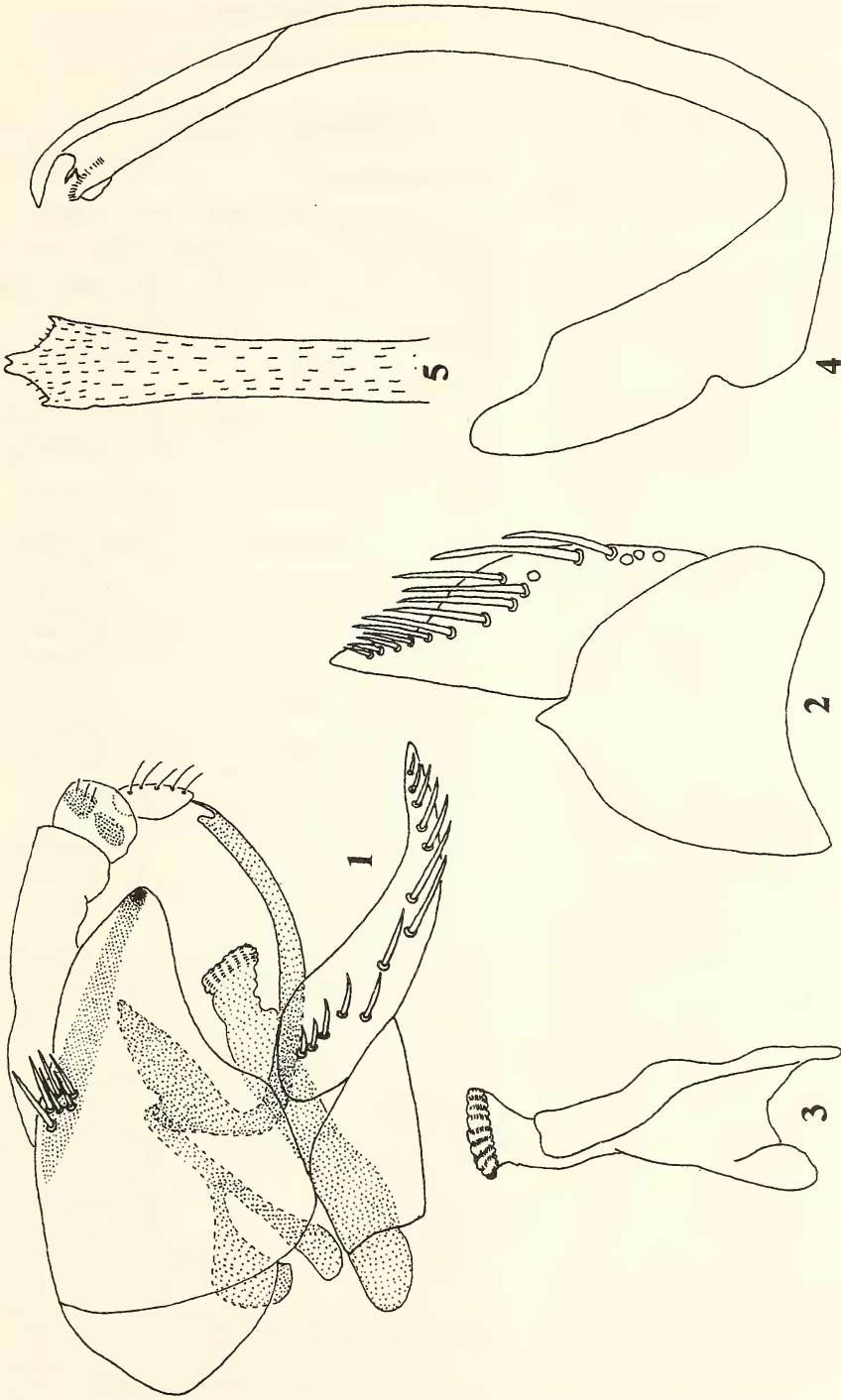
Jassus subgenus *Deltocephalus* Burmeister, 1938: 15. Type species: *Cicada pulicaris* Fallén, type by subsequent designation by Kirschbaum, 1858: 356.

Moderately small, comparatively robust leafhoppers measuring 2.2-4.1 mm. Head including eyes as wide as or slightly wider than pronotum, crown produced beyond eyes and bluntly angular at apex, anterior margin of crown

broadly and smoothly rounded to face, crown in lateral view usually distinctly inflated or convex. Ocelli marginal, small, and rather remote from eyes. Clypeal suture often obscure; clypellus quadrate with sides parallel. Fore wings long and extending well beyond abdomen or shortened and exposing apex of abdomen; in forms with shortened fore wings, the apical cells and each appendix are much reduced and at times rarely open basally, central cell divided or not, outer cell often reduced and sometimes absent.

Male pygophore simple, without prominent processes, but with macrosetae, anal collar with or without a simple process, subgenital plate triangular or rarely hemispherical, not produced into a membranous appendage. Valve and subgenital plates separate. Style with slender and more or less finger-like apophysis. Connective linear and fused with aedeagus; aedeagal shaft broadest in basal half and tapering distally to a slender upturned apex, extreme apex simple or slightly elaborated with small projections or minute teeth on distal margin below apex.

Remarks: The genus shares the characters of fused connective and aedeagus with *Matsumuratettix* Metcalf and *Miradeltaphus* Dash and Viraktamath among the Indian genera. It differs from *Matsumuratettix* in the shape of the aedeagus and from *Miradeltaphus* in having valves and subgenital plates separate. Dash and Viraktamath (1995) treated the genus *Recilia* Edwards as a subgenus of *Deltocephalus* and stated that most of the Indian species assigned to the genus *Deltocephalus* belong to this subgenus. However, the male genitalia of the following species are not known: *brunnescens* Distant, *butleri* Distant, *campbelli* Distant, *coloratus* Distant, *deletus* Baker and *pulvisculus* Distant and hence, they have not been assigned to any subgenus. The Indian species assigned to *Allophleps* agree with the characters of the genus *Deltocephalus* and hence, the following new combinations and a synonym are proposed:



Figs 1-5: *Allophleps inspersa* Bergroth, 1. Male genitalia, lateral view; 2. Valve and subgenital plate, ventral view; 3. Style; 4. Aedeagus, lateral view; 5. Apex of aedeagal shaft, ventral view.

Deltocephalus indicus (Pruthi 1936),
Comb. nov.

Allophleps indicus Pruthi, 1936: 120.
Holotype ♀, Pakistan [ZSI, examined].

Allophleps delhiensis Rao and
Ramakrishnan, 1990: 111. Holotype ♂, India
[NPC, examined]. Syn. nov.

Material examined: PAKISTAN: Holotype
♀, 5411/H7, Lyallpur, Punjab (at light)
10.x.1929, A. Rahman, *Allophleps indicus*
sp. nov., H.S. Pruthi, det. Paratype ♂, 5700/H7,
data as in holotype (ZSI). INDIA: Holotype ♂,
Delhi, 30.iv.1965, inside lamp dome, M.G.R.
Menon *Allophleps delhiensis* sp. nov. Paratypes:
5 ♂ data as for holotype of *A. delhiensis*
(NPC).

Remarks: Female illustrated by Pruthi
(1936: Plate IX, Fig. 3) clearly shows the
reticulate venation on both clavus and corium
of fore wing. However, the wing venation shown
in the text-figure 132a (p. 120) does not show
this. Apparently this wing was taken from a
different specimen. In the type series, the
holotype female (5411/H7) and the paratype
male (5700/H7) and one female from the type
locality (5697/H7) show reticulate venation,
whereas another female from the type locality
(5698/H7) does not show reticulate venation and
also does not belong to this species. The
principal difference suggested in the key by Rao
and Ramakrishnan (1990) between *indicus* and
delhiensis was reticulate venation though they
mentioned slight differences in the structure of
subgenital plates and apophysis of style. The
latter varies with the orientation of the style
while making the diagram. The structure
attributed to subgenital plates in Fig. 132b by
Pruthi (1936: 12) is probably part of the
pygophore lobes. There is no difference in the
structure of connective and aedeagus and
therefore, *delhiensis* is here treated as a junior
synonym of *indicus*.

Deltocephalus menoni (Rao and
Ramakrishnan, 1990), Comb. nov.

Allophleps menoni Rao and
Ramakrishnan, 1990: 113. Holotype ♂, India
[NPC, examined].

Material examined: INDIA: Holotype ♂,
Delhi, 30.iv.1965, inside lamp dome, M.G.R.
Menon (NPC). Paratypes: 5 ♂ data as for
holotype (NPC). Other material: INDIA:
Karnataka: 1 ♂, Dharwar, 22.x.1969, C.A.
Viraktamath (UAS).

The following key will help in the
identification of the known Indian species of
Deltocephalus.⁴

KEY TO THE INDIAN SPECIES OF *Deltocephalus*

1. Fore wings with many accessory cross veins both
on clavus and corium or outer ante-apical cell
narrowed and pointed at apex or divided into two
or more cells 2
— Fore wing without accessory cross veins, outer
ante-apical cell neither narrowed and pointed at
apex nor divided into two or more cells 4
2. Aedeagal shaft compressed and bifurcate 3
— Aedeagal shaft tubular and not bifurcate
..... *pruthii* Metcalf
3. Aedeagal shaft with a short tooth-like process
near gonopore
..... *menoni* (Rao and Ramakrishnan)
— Aedeagal shaft with longer caudally directed
process near gonopore *indicus* (Pruthi)
4. Head with red markings 5
— Head without red markings 6
5. Vertex of head with four red spots, pronotum with
red stripes *deletus* Baker
— Vertex of head with a pair of longitudinal red
stripes between eyes, pronotum with black
longitudinal lines *coloratus* Distant
6. Apex of hind tibia with a black patch; head,
thorax and fore wings with brown spots
..... *pulvisculus* Distant

⁴Dash and Viraktamath (1998) described 24 new species of
Deltocephalus (that are not included in this key) and also gave
a key to all the known species of *Deltocephalus* from India
and Nepal.

TAXONOMIC POSITION OF INDIAN DELTOCEPHALINE LEAFHOPPERS

- Apex of hind tibia not marked as above, other characters not as above 7
- 7. Predominantly black or chocolate brown species 8
- Ochraceous or stramineous with fuscous or black spots 9
- 8. Colour black with yellow transverse bands on face, crown, pronotum and scutellum *banda* (Kramer).
- Anterior half of vertex black with three white spots, pronotum scutellum and fore wings chocolate brown *prabha* (Pruthi)
- 9. Fore wing with zigzag reddish-brown marking *dorsalis* Motschulsky
- 10. Head and thorax orange red or orange yellow with or without a black spot on disc of vertex *porticus* Melichar
- Head and thorax ochraceous or fuscous with or without black markings 11
- 11. Vertex with prominent large black markings or with marginal black band surrounding white spots 12
- Vertex with either fuscous or small black spots or without any markings 14
- 12. Anterior margin of head with a black stripe spotted with white; subgenital plates as wide as or wider than inner margin, apically strongly rounded *distinctus* Motschulsky
- Disc of vertex with one or more large black spots; subgenital plates triangular 13
- 13. Vertex with one apical large black spot *bulteri* Distant
- Vertex with three black spots *maculatus* (Pruthi)
- 14. Vertex with four small anterior fuscous spots, with a longitudinal fuscous stripe on either side of median line and a transverse series of fuscous spots on pronotum, fore and mid-tibiae annulated with brown *brunnescens* Distant.
- Not with above combination of characters ... 15
- 15. Vertex with anterior marginal spots, anterior aspect of pronotum obscurely tuberculate, fore wing pale ochraceous with white spots *campbelli* Distant
- Not with above combination of characters ... 16
- 16. Aedeagal shaft short, stout at apical 0.33, dorsally upturned with ventral apical extension 0.66 as long as shaft, dorso-apical angle spine-like *indicus* (Rao)
- Aedeagal shaft not as above 17
- 17. Male subgenital plate strongly narrowed caudally, lateral margin straight in distal 0.66, aedeagus with ventral margin widened in middle beyond gonopore then narrowed *veinatus* (Pruthi)
- Male subgenital plate gradually narrowed caudally, lateral margin either straight or concave in apical 0.33; aedeagus with ventral margin not as above 18
- 18. Aedeagus with ventral margin narrowly produced beyond gonopore; pronotum with black transverse stripe *bicolor* (Pruthi)
- Aedeagus with ventral margin not as narrowly produced as above, straight or slightly curved; pronotum without a transverse black stripe 19
- 19. Fore wing greyish-white with costal and claval margins and a median longitudinal band fuscous; male abdomen with basal apodemes broader than long *fletcheri* (Pruthi)
- Coloration not as above; abdominal apodemes of male longer than broad 20
- 20. Aedeagus with gonopore restricted to apex *hospes* Kirkaldy
- Aedeagus with gonopore not restricted to apex 21
- 21. Style with apophysis slender, laterally curved and tapering caudally *intermedius* Melichar
- Style with apophysis rather robust, if slender then straight 22
- 22. Aedeagal shaft slender, elongate, 1.5 times as long as connective, strongly bisinuate *jagannathi* Dash and Viraktamath
- Aedeagal shaft rather stout, shorter than 1.25 times length of connective, not bisinuate 23
- 23. Apophysis of style bidentate ventrally, basal abdominal apodemes short, lobe-like *tareni* Dash and Viraktamath
- Apophysis of style with a single ventral tooth basal abdominal apodemes longer 24
- 24. Apex of aedeagal shaft acutely pointed in dorsal aspect *chhota* (Pruthi)
- Apex of aedeagal shaft not acutely pointed *krameri* (Rao and Ramakrishnan)

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